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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/003,625	11/02/2001	Joseph R. Montano	50680	5272

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EXAMINER	
OLTMANS, ANDREW L	
ART UNIT	**PAPER NUMBER**
1742	

DATE MAILED: 07/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/003,625	Applicant(s) MONTANO ET AL.	
	Examiner Andrew L Oltmans	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-15,18-26,30-32,34-37 and 41-46* is/are rejected.

7)☒ Claim(s) *5,16,17,27-29,33 and 38-40* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *7,8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 11 is objected to because of the following informalities:

In claim 11, the word "on" in line 2, appears to be a typographical error, wherein the correct word appears to be --or--.

Appropriate correction is required.

2. Claim 11 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 11 recites that "the adhesion promotion composition comprises an oxidizer, a corrosion inhibitor on [sic] mixtures thereof". However, claim 1, from which claim 11 depends recites that "the adhesion promotion composition comprises a mixture of sulfuric acid and phosphoric acid". The role of the sulfuric and phosphoric acid (if any) is not recited in claim 11.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Ameen et al. 5,885,436

4. Claims 1-4, 6-10, 13 and 22-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ameen et al. 5,885,436 (Ameen).

Ameen teaches a method for treating a metal surface wherein the method includes the contacting of the surface with the claimed amount of a combination of sulfuric acid and phosphoric acid prior to the contact with the surface the claimed amount of organo-silane compound (including the claimed silane compounds), as recited in claims 1-4, 6-10 and 13 (abstract and col 5):

> The metal foil is contacted with the acidic solution via any conventional means including but not limited to dipping, spraying, wiping, immersing and the like. In a preferred embodiment, the metal foil is immersed in the acidic solution. In another preferred embodiment, the temperature of the acidic solution is from about 20° C. to about 60° C., and more preferably from about 30° C. to about 40° C.

(see also col 4, lines 39-47; col 5, lines 47-50)

and (col 7):

> After the metal foil has contacted the metal foil oxidizing solution and the chromium containing electrolytic bath, the metal foil is contacted with a solution containing a silane compound in a suitable solvent. The silane compound is present in the solution in an amount from about 0.1 to about 10% v/v, and preferably from about 0.2 to about 5% v/v, and more preferably from about 0.3 to about 3% v/v. Preferred silane compounds are silane coupling agents. Preferred silane coupling agents are amino-silane compounds, epoxy-silane compounds, and alkoxy-silane compounds.

(see also col 8, lines 1 to col 10, line 23; col 10, lines 46-56)

and (col 5):

> inorganic acids are preferred. Specific examples of inorganic acids which may be utilized in the acidic solution include halogen acids such as hydrofluoric acid, hydrochloric acid, hydrobromic acid and hydriodic acid, sulfuric acid, sulfurous acid, nitric acid, perchloric acid, boric acid and phosphorus acids such as phosphorous acid and phosphoric acid, and combinations thereof. Nitric acid and sulfuric acid are

With respect to claims 22-23, Ameen teaches that that the substrate is copper and that the post-treatment includes treatment wit a polymeric material (col 11, lines 3-22). The claims do not distinguish over the teachings of Ameen.

With respect to the limitation "to form a micro-roughened conversion coated metal surface", the roughness and conversion coating are anticipated because the roughness and conversion coating would inherently form on the metallic surface when the sulfuric acid and phosphoric acid are applied to that surface because both the claimed invention and the teachings of Ameen perform the same method steps (i.e. contacting a metal surface with a composition including sulfuric acid and phosphoric acid), see MPEP 2112.01.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Bayes et al. 6,054,061 in view of Adlam et al. 5,861,076

6. Claims 1-3, 7-15, 18-26, 30-32, 34-37, and 41-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bayes et al. 6,054,061 (Bayes) in view of Adlam et al. 5,861,076 (Adlam).

Bayes teaches a method for treating a metal surface in the manufacture of printed circuit boards wherein the method includes the contacting (for the times instantly claimed) of the surface with the claimed amount of a combination of sulfuric acid and phosphoric acid (col 5, lines 15-17), oxidizer (col 5, lines 5-13), corrosion inhibitor (col 5, lines 28-37), reducer/ammonium compound (col 5, lines 38-59), and dissolution agent (col 5, lines 60-67), free of surfactants, as recited in claims 1, 7-15, 18-21, 24, 31-32, 35 and 42-45. Bayes teaches that the treatment with the above-mentioned chemical provides a suitable treatment for copper, wherein the treated copper is subsequently coated with a polymer material (col 6, lines 53-67), as recited in claims 22-23, 34 and 46.

Bayes fails to meet all the limitations of the instant claims in that Bayes does not explicitly teach the silane treatment or the alkaline rinse.

Adlam teaches that treatment with silane is desirable because it increases the bonding of the treated copper surface to the resinous substrate, and provides mechanical linkages that withstand thermal and mechanical excursions (col 9):

> Suitable coupling agents for use in the present invention include amino coupling agents and amino-silane coupling agents. The coupling agents improve the bonding of the treated copper surface to the resinous substrate. This will provide a mechanical linkage so that the finished product is able to withstand thermal and mechanical excursions. Further, the passavation treatment prevents oxidation of the copper surface during storage, prior to subsequent lamination and improves resistance to acid. The preferred thickness of the coupling agent is a monomolecular layer, but a greater thickness, i.e., several monomolecular layers would function as well.

Adlam also teaches that the treatment with alkaline composition (instant claim 24) is desirable because the alkaline rinse provides a complete conversion of the surface coating and provides a stable surface for subsequent coatings (col 7, lines 34 to col 8, line 9). Adlam teaches the specific silane compounds recited in claims 2-3, 25-26, 36 and 37 (col 9):

> Non-limiting examples of suitable coupling agents are silyl amines such as γ-aminopropyl-triethoxy silane, $(NH_2(CH_2)_3 Si(OC_2H_5)_3$, an aminoalkyl silane solution such as amino alkyl silane solution A1106 available from Union Carbide Co. This is believed to be an oligomeric aminosilane having the general formula, $(NH_2—CH_2—CH_2—CH_2—Si—O_{1.5})_n$ wherein n is from 1 to about 3; modified aminosilanes such as a triaminosilane solution A1128, available from Union Carbide Co., vinyltrimethoxysilane, β-(3, 4-epoxycyclohexyl) ethyltrimethoxysilane, γ-glycidoxypropyltrimethoxysilane, isocyanato silanes such as isocyanato propyl triethyl silane and the like; or amines such as isopropyl amine, triisostearoyl amine, titanate

One of ordinary skill in the art would have found the steps of silane treatment and alkaline rinsing obvious because one of ordinary skill in the art would have been motivated to provide Bayes with the desirable properties taught in Adlam, including the increased bonding of

polymeric material, wherein the silane material provide mechanical linkages that withstand thermal and mechanical excursions, as taught in Adlam, by providing Bayes with a silane coating (Adlam: col 9, lines 14-26). One of ordinary skill in the art would also have been motivated to provide an alkaline rinse to Bayes, as taught in Adlam, in order to provide Bayes with the desirable properties of complete conversion of the surface coating and a stable surface for subsequent coatings (Adlam: col 7, lines 34 to col 8, line 9).

Allowable Subject Matter

7. Claims 5, 16-17, 27-29, 33 and 38-40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

a. A primary reason for the allowance of claim 5, under the above conditions, is that the prior art fails to teach or suggest, either alone or in combination, the instantly claimed method wherein the silane treatment includes the structure instantly claimed, particularly wherein the composition is an organosiloxane.

b. A primary reason for the allowance of claims 16-17 and 33, under the above conditions, is that the prior art fails to teach or suggest, either alone or in combination, the instantly claimed method wherein the adhesion promotion composition further comprises a halide ion.

c. A primary reason for the allowance of claims 27-29 and 38-40, under the above conditions, is that the prior art fails to teach or suggest, either alone or in combination,

the instantly claimed method wherein the silane treatment includes the structure instantly claimed, particularly wherein the composition is an organosiloxane or organosilazane.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew L. Oltmans whose telephone number is 703-308-2594. The examiner can normally be reached 7:00-3:30 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Andrew L. Oltmans
Examiner
Art Unit 1742

July 18, 2003